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E D I T O R I A L

THE NARCOTICS PROBLEM

IN this issue we publish a review on the subject of opium production and control. The reader will find in this article much interesting data now available through Unesco's Commission on Narcotic Drugs and from other sources. There are a number of aspects of this problem often overlooked by those of us who are so closely identified with the legitimate sale and use of opium, its products, and alkaloids. One is the fact that morphine and heroin have become important political tools used against certain countries with telling effects. Nothing, pound for pound, commands a greater price on the illegitimate market than heroin or morphine. These have become, therefore, a means of raising funds in certain countries whereby subversive elements and activities can be financed and critical raw materials purchased. Such drugs find a ready market at high prices and the transactions involved are cloaked in secrecy for obvious reasons. Not only is evidence available that such illicit commerce takes place but it appears that efforts to increase the number of addicts are also made as a means of increasing the demand. The ways of our enemies are devious indeed!

Another point of importance to all Americans is the obvious fact that the agency responsible for suppressing illicit traffic in narcotics is not sufficiently staffed or supported financially to carry out this tremendous task. It seems certain that in certain areas of the world huge quantities of opium and morphine are produced annually which are intended from the very outset to supply the illicit demand. Since American dollars represent the hardest currency in the world market, it is only natural that we should stand high on the list of desirable markets. To make matters still worse for us, we have thousands of miles of ungarded shoreline, an almost unwatched border with our neighboring countries, hundreds of air-flights daily into our cities from over-seas and thousands of foreign seamen given the freedom of our ports. As Americans we resent unwarranted and undue search of our persons and we extend this same courtesy to most of our visitors. In spite of the best efforts of the Bureau of Narcotics, large quantities of illicit drugs do get in. The toll which they exact in human misery and suffering is unbelievable.

Possibly the most contemptible criminal of all is the person who, although not an addict himself, encourages it in others to increase his nefarious trade and profit. The addict who sells to others as a means of obtaining more of the essential drug for himself is of course a menace but he must be pitied. The coldly calculating non-addict who engages in the business is worse than a murderer for he destroys men's souls as well as their lives and for profit only. Greed and avarice are his only motives for this mortal sin.

The depths of depravity to which addicts can sink are known only to those intimately associated with this problem. No crime or act of immorality is too great should it be the price asked to insure their supply of the drug. They become ready and willing thieves, murderers and prostitutes, thoroughly enslaved to their master's will. The cost of such activities to the nation are staggering compared to the money spent towards their control.

Pharmacists, by and large, are quite meticulous in their conformity with the law and their cooperation with those responsible for narcotics control. In all likelihood our record on the whole is as good or better than that of the medical profession. In no other area should our performance be more circumspect. Not only do we know full well the hazards of narcotics but we alone are entrusted with their legal sale. When we fail to abide by the letter of the law we deserve severe censure. Those who knowingly and willfully divert narcotics into illicit channels should be permanently barred from practice. Pharmacists who try to defend those guilty of such serious malpractice are in essence attacking the very foundations upon which our profession rests and inviting a public vote of no confidence. Such acts threaten the discontinuation of those special privileges which we enjoy, not as an inalienable right but only by public sufferance.

Narcotic agents should be our friends and colleagues working toward a common goal in the public interest. They should not be viewed with suspicion and distrust as is often the case. Their task is difficult at best and we should try to make it easier. The honest pharmacist has nothing to fear and he can in truth find in his narcotics officer a friend and ally who can help him through many a complex and confusing situation. To do the job the public expects of us and has entrusted to us we need each other's help and cooperation.

L. F. TICE

OPIUM, PRODUCTION AND CONTROL

By Nedim Nur Evcim *

INTRODUCTION

OPIUM is the air-dried milky exudation obtained by incising the unripe capsules of *Papaver somniferum* Linné or its variety album DeCandolle. It yields not less than 9.5 per cent of anhydrous morphine (1).

Its significance in medical science and pharmacy is, of course, due to its high alkaloidal content. The physiological activity of these alkaloids, which are twenty-five in number, is not included in the subject of this paper. Their addictive properties, however, must be mentioned, which also explain the legal and social importance of opium and products obtained from it.

Besides ruining the lives of millions, opium has caused wars in the past, it has served as a paralyzing weapon for countries to invade others, and even to-day heroin, the most frightful of the products obtained from opium, is being used as a secret weapon, as will be explained later in this paper.

VARIETIES AND CULTIVATION (3, 6, 8, 13)

The poppies cultivated in Turkey, and very possibly in other producing countries, form a "population" composed of various strains of *Papaver somniferum* L., whose characteristics are constantly changing. Attempts to obtain varieties with stable characteristics and a higher yield have not yet given satisfactory results. The only varieties which may be differentiated are var. album DeCandolle and var. nigrum DeCandolle. The first has a closed capsule, and the other an open one. The latter is being cultivated for the oil from the seeds rather than for opium.

P. setigerum is the only other species of the genus *Papaver* which contains morphine. It grows wild in the Mediterranean region.

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Cultivation.—

a) Climate: The poppy is a hardy plant. It will grow in varying climates but it cannot endure extreme cold. In a cold climate, its opium yield is greatly diminished (as in poppies cultivated in European countries as an ornamental plant). Climatic conditions, particularly humidity, affect the yield more than any other factor.

b) Soil: The poppy does not thrive on heavy, clayey soils or sandy soil. The ideal is an average soil treated with manure or chemical fertilizers, for the poppy plant impoverishes the soil.

c) Growth cycle: The poppy is an annual and may be sown in autumn or spring. The choice depends on the "race", on economic conditions and, above all, on climate. The most important point is the alteration of rainy and dry seasons, which determines the opium yield. In poppy-growing areas, which are generally warm temperate zones, the sowing time may begin in September and continue to as late as April. The autumn poppy is hardier and has a higher yield, but in regions where the winter is severe it naturally runs greater risks than the spring poppy.

Germination lasts two to three weeks; about a month later the first four leaves appear; and two or three weeks later the stem begins to form. In this first period of growth the plant needs a high degree of moisture, but not in later periods. The plant reaches full development in about two months. The flowering season varies according to climate and other conditions, and according to sowing date; the plant flowers by day and the flower lasts 30 to 40 hours. After the petals fall the capsule continues to grow and is ripe in about two weeks.

In Turkey 60 to 70 per cent of the districts, on which the poppy plant is grown, lend themselves to autumn cropping; spring cropping entails something of a risk. In that case the sowing is done in April and the opium obtained in July or August. Apart from cereal grains, poppy is the only autumn crop and it is difficult to replace it by spring crops such as cotton, maize, sugarbeet, tobacco, melons, etc.

d) Care: The poppy requires a rich soil and impoverishes it rapidly. A system of rotation must therefore be followed, or alternatively the plant must be sown on land that has lain fallow or on intensively fertilized land. The use of chemical fertilizers, which are very successful, is not wide-spread in the poppy growing regions. For that purpose the Turkish peasant usually has his poppy field near

the village so that it may be fertilized by the natural manure of the herds; 30-40 tons of manure per hectare are needed.

The main work to be done during growth is weeding, thinning out (the latter being done after the first four leaves have formed, leaving about 15 plants per square meter) and the nipping off of a number of capsules on each plant to allow the remaining three or four to develop better.

e) Harvesting: Opium is harvested in two phases. The incision of the capsule and the collection of the latex. The period varies according to climatic conditions but is about two weeks after the petals fall. The capsule should be hard; its colour depends on the local variety. The time for harvesting lasts about one week, after which the capsule dries. However, as not all the capsules ripen at the same time, even in any one field, harvesting may last over two weeks. The incision of the capsule is the vital operation and a highly skilled one. The latex is between the epicarp and the mesocarp, the juice channels running from below upwards. A great many channels must be made, but the wall of the capsule must not be cut right through or the latex will run down inside and be lost. Incisions are made at sunrise or sunset, and it takes from 8 to 14 hours for the latex to exude and solidify (into brownish masses). The technique of incision is important, for the capsule must not be killed, and must therefore never be cut all round. Several incisions may be made in the same capsule, but in that case the percentage of morphine in the latex decreases. When the latex has caked it is collected with a blunt-bladed instrument which scrapes the capsule without taking off the underlying vegetable tissue and thus spoiling the purity of opium.

f) Yield: The yield of opium per hectare is a very difficult question, depending on many factors.—The nature of the soil, the climate and annual rainfall, the state of the seed, etc. That is why statistics show a variation of 1 to 6 Kg. between one year and another (with the same soil and race) and of 1 to 15 Kg. between different countries. The yield in Turkey averages about 10 Kg. of opium per hectare. The yield of Indian opium seems to be much higher, but it must be noted that in Turkey only one incision is usually made in each capsule, whereas in India incisions are repeated until all latex has exuded, with the result that the quantitative yield is much higher.

In addition, as already indicated, the opium poppy is cultivated on a rotation system; in other words, the peasant actually grows

opium in any one field only every third or even every fourth year. This also to some extent explains the differences in yield.

HISTORY OF USE AND INTERNATIONAL CONTROL (4, 5)

The use of opium goes back to 5000 B. C. On the clay tablets of the ancient Sumerians it was recorded that the juice of the poppy was "collected in the early morning". This people of the land of Sumer in lower Mesopotamia cultivated the poppy in order to extract its juice; "gil" was the name they gave it which translated means joy or rejoicing, and this name is still used for opium in some parts of the world.

It was the Babylonians, inheritors of the Sumerian civilization, who, with their expanding empire, spread the knowledge of the poppy's medicinal properties eastward to Persia and westward to Egypt where its use as a remedy for human ailments was known as early as 1550 B. C. The Greeks too, early learned its uses, for it is from their word "opion", juice of the poppy, that the present Latinized word comes. Homer in the *Iliad* speaks of "the intoxicating poppy, the poppy saturated with lethal slumber".

In the fourth century B. C. Hippocrates of Cos thought well of it and recommended "drinking the juice of the white poppy mixed with the seed of the nettle".

Arabic doctors, both Moslem and Christian, were prodigal in the use of opium in their cures; among others, it became used as a specific for diarrhea. It can be said here that until the twelfth century the use of opium was largely confined to medicinal purposes.

It was during the tenth century that knowledge of the famed Arabic Pharmacopeia was taken to China by Arab traders and traveling physicians and with them went the drug itself. Eastward from its ancient home through Persia to India was another road the poppy traveled to become naturalized. That it thrived there is evidenced by the Portuguese, Barbosa, companion and friend of Magellan, who in 1511 could write of the "opium which Moors and Indians eat".

Opium was also known in western Europe. By the middle of sixteenth century its use was both accepted and fairly well understood by physicians and pharmacists. Paracelsus first used the term laudanum in 1537, and in the eighteenth century Le Mort made the first preparation of paregoric. In 1805, a German pharmacist named

Sertürner first isolated morphine from opium. This was also the beginning of modern alkaloidal medicine.

Meanwhile in China opium was beginning to be misused and later it became a serious source of trouble. This was mainly due to the flooding of China with opium brought by European traders. The Emperor Yung Chen was the first to issue an edict against the habit-forming smoke (1796). His proclamation, initiating a series of laws against opium smoking, said nothing, however, about the steady tide of opium flooding China from foreign ports. Finally, in 1800, the importation and cultivation of the opium poppy were prohibited. But in spite of the law, the opium trade continued, growing unabated. It was not long before opium became the cause of the Opium War (1840-42) between Great Britain and China which was terminated by the Treaty of Nanking in 1842. The result was, of course, an overwhelming victory for the English, and five ports: Shanghai, Canton, Foochow, Amoy and Ningpo were opened to free trade.

The Shanghai Conference—1909: The first step in international campaign against narcotic drugs took place in 1909 when an International Opium Commission met in Shanghai on the initiative of the United States Government which had become seriously concerned over the problem of addiction in the Philippines. The Conference could not accomplish more than recommending that each delegation concerned move its own Government to take measures for the gradual suppression of the practice of opium smoking in its own territories and possessions.

The Hague Convention of 1912: It was considered important that international effect and sanction should be given to the resolutions of the Shanghai Conference and the delegates met at The Hague. The convention finally agreed upon a number of general principles which remain as the foundation and mainspring of all drug control. The production and distribution of raw opium was to be subjected to control, no limitation was placed on the quantity to be produced or to be distributed except indirectly by means of restricting exports in accordance with the legal requirements of the importing countries, nor were any measures indicated as to how control over production and distribution was to be effected. The Convention did not come into general application until after the end of World War I.

The Geneva Convention of 1925: The aims of the convention are stated in the preamble, which notes that the Hague Convention pro-

duced results of great value, but that illicit traffic in and abuse of narcotic substances still continued on a large scale, and that it was necessary to examine the question of the limitation of the amounts of morphine, heroin, or cocaine and their respective salts to be manufactured; of the limitation of the amounts of raw opium and coca leaf to be imported for that purpose and for other medicinal and scientific purposes. After prolonged sessions none of these resolutions was accepted. The only significant accomplishment was the creation of the Permanent Central Board to supervise a statistical system of international control. The parties undertook to furnish to the Board estimates of the quantities of each narcotic substance to be imported into their territory for internal consumption during the following year.

The 1931 Convention: The goal of the convention was to accept the proposals for limiting the manufacture and regulating the distribution of narcotic drugs which were not accepted in the Geneva Convention. An international Conference was held under the League of Nations and a system of limitation based upon estimates was set up. Each country was requested to submit an estimate of the quantities necessary for medical and scientific needs, for conversion or export, and for the maintenance of stocks by August 1st of the year preceding that for which the estimate is made. A Drug Supervisory Body was set up by the Convention to examine these estimates.

The 1936 Convention: The object of the 1936 Convention is stated in the Preamble to be "to strengthen the measures intended to penalize offenses" contained in the previous international conventions and "to combat by the methods most effective in the present circumstances the illicit traffic in the drugs and substances covered by the Conventions". The convention took provisions to prevent narcotic traffickers from escaping prosecution because the laws of the country in which they resided did not cover smuggling offenses committed abroad. It also provided that the contracting parties should set up a central office to supervise and coordinate all operations necessary to prevent the illicit traffic.

Under the United Nations Organization: In February 1946, the United Nations Economic and Social Council established the Commission on Narcotic Drugs to take over the duties of the Opium Advisory Committee which was previously working under the League of Nations. The Commission is composed of fifteen members of the United Nations which are important producing or manufacturing

countries or countries in which the illicit traffic in narcotic drugs constitutes a serious problem. The Commission holds annual sessions and its significant duties are: (a) to supervise the application of international conventions and agreements dealing with narcotic drugs; (b) to advise the Economical and Social Council on all matters pertaining to the control of narcotic drugs and prepare such draft international conventions as may be necessary; (c) to consider what changes may be required in the existing machinery for the international control of narcotic drugs.

In May and June 1953 an Opium Conference was held in the United Nations, and the results of this Conference will be discussed in the last section of this paper.

PRODUCTION AND CONTROL IN DIFFERENT COUNTRIES (3, 7, 8, 11, 12, 17, 18, 19)

The areas on which the opium poppy is grown extend from south-eastern Europe to the Far East. The situation in each country of this area will be discussed and some statistical data will be given at the end to present a general picture of the opium production on the world.

EUROPE.—

Yugoslavia: Opium is produced legally in Yugoslavia and most of it is exported. The production is done in state farms and therefore control is not a big problem. Before the war average annual production was about 65 tons; now, after the war it is about 20-25 tons.

Bulgaria: Produces and exports opium. Annual production is not significant compared with other producing countries, and it has fallen down considerably since the war, from 6 tons per year to about 1.

Greece: Produces a small amount of opium necessary for its domestic medical and scientific needs.

AFRICA.—

Tunis: Opium is not produced legally. A very small amount of illicit cultivation is estimated. (About 25 Kg. of opium per year.)

Egypt: Cultivation of the opium poppy is now completely prohibited in Egypt, but some illicit cultivation and production exists.

In 1948, five tons of opium were seized and 45 hectares under cultivation destroyed.

ASIA.—

Syria, Lebanon, Arab States on the Arabic peninsula: In 1950 the Political Committee of the League of Arab States created a Permanent Anti-narcotics Bureau empowered to put forward to the governments concerned "proposals for the consolidation and enforcement of the legislative and administrative measures to be taken" in respect of the production and smuggling of narcotics. The report on the first year of the Bureau's operations stated that a new law on narcotics control was about to be drawn up in Saudi Arabia. In all these states growing of hashish is the more important problem; opium poppy does not easily lend itself to the climate of this region.

Iran: is one of the chief opium producing and exporting countries. It is also one of the countries where opium addiction is widespread. At the 1949 session of the Commission on Narcotic Drugs, representatives of United States and the United Kingdom estimated the current production in Iran as 1500 tons or more annually. The representative of Iran considered this figure too high, and indicated a possible production of 350 to 400 tons. He also informed the Commission of the future policy of its Government, which was then before the legislature. It would be based on four principles: Limitation of the production to medical and scientific needs, prohibition of the sale and use of opium within Iran, strict limitation of exports to medical and scientific requirements and cooperation in the international attempt to control production. It must also be noted that he added, "as poppy cultivation played an important role in Iran's economy, his government would request the allocation of a reasonable share of the world production, in case of any quota system to be arranged in the future."

Afghanistan: Opium production has been legally prohibited since 1945. However, no information was available to the Commission on Narcotics as to the observance of this prohibition. The annual reports of India mentioned continued smuggling from Afghanistan. The estimated production is about 75 tons a year.

Pakistan: The cultivation of the poppy for the production of opium is limited to the Khairpur State. In remaining areas cultiva-

tion is strictly forbidden. While opium-smoking is prohibited in Pakistan (except for existing addicts on medical grounds) the Government of Pakistan issued a directive in 1950 to the provincial governments and federal states to consider and adopt more stringent measures to ensure complete prohibition of opium smoking without any exception. The, so-called, quasi-medical use of opium as in neighbouring countries also exists in Pakistan.

India: is one of the major opium-producing, opium-exporting, and opium-using countries. Most of it is eaten rather than smoked and most of it is taken for quasi-medical purposes. It is difficult to draw a line between such uses and outright addiction. Since 1948 the Indian Government has begun taking measures to suppress the use of opium except for medical purposes. In 25 out of 27 states constituting the Indian Union, laws are in force controlling opium-smoking; out of 25 states 6 prohibit it completely, while others have accepted a policy of gradual suppression.

The growing of opium in India is a government monopoly, and production is strictly controlled by issuing licenses for the area of land to be planted with opium poppy and also authorizing individuals as cultivators. The acreage planted has steadily decreased for forty years.

Burma: The situation is similar to Pakistan and India in Burma. No cultivation is allowed, and a policy of gradual suppression is followed in the use of opium.

Thailand, Cambodia, Laos, Vietnam: No figure of production is available from these countries. Consumption exists in all of them and it is apparently met by both domestic production and out of opium confiscated in the illicit traffic.

Nationalist China: Quasi-medical use of opium exists also in this country and the sources are similar to the ones mentioned for the previous group of nations.

Communist China: Although the Government of the People's Republic states that the production of opium and its products is under Government Monopoly, there are no data available; and a number of evidences show that this country is the largest source of illicit traffic in narcotics. This situation will be discussed further in the next section of this paper.

Union of Soviet Socialist Republics: Until recently little was known about the situation in Russia. Apparently, the production is restricted to the Republics of Kirghiz and Kazakhstan and the necessary amount of opium for the manufacturing and medical uses is produced within the country.

Japan: has ceased to be a producing country; cultivation of the opium poppy is strictly forbidden.

AMERICAS.—

Argentine and *Chile:* have experimented in opium production. So far their efforts have remained without much success.

Mexico: is the source of a significant amount of illicit opium and its derivatives. An estimated 4000-5000 hectares are cultivated and 32-40 tons of opium are produced annually.

TURKEY:

As Turkey is the chief opium exporting country of the world, and as the largest amount of data and information is available from this country, it is worth studying it more in detail and under a different class itself.

The opium obtained in Turkey can be classified into three types according to the area of production:

(i) From the "druggist" opium producing area. This area is in the western part of Turkey and constitutes the vilayets of Afyon, Konya, Burdur, Isparta, Kütahya. The morphine content of this opium is average.

(ii) From the northern "soft" opium producing area. Three vilayets in the middle-northern part of Turkey (Amasya, Tokat, Corum) are in this area. The opium contains a high per cent (13-14%) of morphine.

(iii) From the southern "soft" opium producing area. The vilayet of Malatya, in the south-east of Turkey forms this area.

All opium obtained in these areas is collected at the Office of Soil Products and low and high (up to 25% morphine) grades are mixed and ground together to give the standard product to be exported, which contains 13-14% morphine. The Turkish Pharmacopoeia requests a minimum morphine content of 12% (2).

The opium poppy is grown only by small farmers in Turkey. The incision and harvesting of opium require much labor and hired labor is not economical. Therefore, the peasant usually plants no more than 0.1 to 0.3 hectares and, as they usually have no machinery, he tills his field with oxen. The poppy is never grown on the state farms and almost never in large farm holdings. Opium is of great importance to the small farmer because it is harvested before the grain harvest and brings in the money which the peasant needs to meet the expenses of the main harvest. It is obtained in a period when he has little to do and he can spend his time on the incision of the poppies and the collection of opium.

Turkey accepted the international protocols in 1933.

The law applied at present requires the producer to sell his product either directly to the Office of Soil Products, to an organization authorized to buy on behalf of the office, or directly to dealers having a trade license from the government. Dealers and producers must deliver all opium in their possession to the Office not later than the end of September of the same year. The producer must also submit to the government a declaration of the quantity of opium sold, not later than three days after the sale, so as to prevent any opium from being smuggled by the dealer. This declaration is essential for any sale, and the dealer concerned is required to submit it to the Office when he delivers the opium.

Every year, the Office, in collaboration with the Ministries of Economy, Trade and Agriculture, and taking into consideration the agricultural and economic possibilities and the prospects for exportation, determines the regions where the poppy is to be grown and the persons to whom permission to gather opium will be granted. No production is allowed within 100 kilometers of the border or coast. An effort is made to maintain a constant production of opium. The area cultivated is about 30,000 hectares a year.

The Office of Soil Products also controls, in collaboration with the Ministry of Agriculture, the improvement of poppy growing and the production of opium for sale, supervises the purification of the opium that has been bought, and provides for the standardization.

Total world production of opium: The following table is obtained from the records of the Permanent Central Opium Board, which controls the production, export and import statistics for opium from each country.

Country:	1947	1948	1949	1950	1951
	(Raw opium produced in metric tons)				
India	429.7	342.2	220	230.7	526.7
Turkey	302.7	380.2	10.4	184.8	357.8
Iran	3.5	21.3	199.7	480.9	32.2
USSR	73	75	76	85.7	93.8
Yugoslavia	23.4	21.5	0.5	19.2	22
Bulgaria	3.4	4.4	0.7	1	0.9
Laos & Vietnam	?	?	?	?	?
Other	0.1	0.1	—	0.5	—
Total	835.8	844.7	507.3	1002.8	1033.4

Certain reservations must be made regarding the figures given above. Several of them, in fact, represent not actual production but only the amounts bought from producers by the state monopolies, and their significance depends not only on the efficiency of the control exercised in the country in question but also to a large extent on the amount of total quantity harvested which the government agencies decide to acquire. The variations occurring from year to year are involuntary rather than deliberate in so far as they depend on weather conditions. The most accurate statistics supplied by opium producing countries are those relating to exports, these transactions being easier to control than are production and consumption.

Since the end of World War II, the reported licit production of opium shows a decline by comparison with the pre-war figures. This decline is explained by a falling-off in the licit use of opium for non-medical purposes; it is, however, partly offset by the steady increase in demand for medical and scientific purposes.

The total of the reported estimates for morphine and chemicals derived from it was 100 tons for the year of 1953. Assuming another 20 tons would be needed for the countries which did not report, and accepting an average morphine content of 10%, 1200 tons of raw opium would be needed for only medical use in 1953. Although no production figures are available for 1953 yet, they are close to those of previous years. However, it must not be forgotten that these figures hardly represent the actual amount of production and still a few countries do not give any statistics at all.

ILLICIT PRODUCTION, TRADE AND USE (4, 10, 14, 15)

Sources of illicit opium traded on the world to-day are found both in countries, where opium is cultivated legally and in countries where cultivation is legally prohibited. In the first group are: India, Indochina, Iran, Nepal, Thailand, Turkey and Yemen. In the other group are: Burma, Communist and National China, Egypt, Japan, Lebanon, Federation of Malaya and Mexico. No one knows the total amount of illicit opium produced and consumed, but it is certainly hundreds of tons, possibly even thousands over the world in the course of a year. Most of the non-medical consumption is in certain producing countries such as China and Iran, but much opium is also smuggled to non-producing countries. Moreover, illicit opium is the main source of illicit morphine and heroin. Sometimes it is converted to the, so-called, "white drugs" in the country of origin, sometimes only after being smuggled to other countries.

When illicit opium is seized by enforcement authorities it is desirable to know from where it came. The circumstances of seizure may tell something. An expert may tell by the appearance of the opium itself, its color and texture. However, more scientific methods of determination of the origin has been searched by collaborative studies of scientists from several countries and satisfactory methods have been devised recently. They usually depend on the present amounts of certain minor alkaloids in opium and also on their ratio to each other.

In Turkey, there usually exists a 5 to 10 per cent difference between the estimated production and the amount standardized by the Office of Soil Products. This may be due to high estimates by the government, and partly due to the drying of opium during the time between collection and standardization. However, the amount passing into illicit use can never be more than 5%, because of the strict control and heavy fines. Non-medical consumption of opium does not exist in Turkey, except perhaps in a few sporadic cases. A more troublesome problem is the clandestine manufacture and smuggling of heroin. In 1951 Turkey headed the list for the seizures of illicit heroin. Since then, strict measures to prevent this situation were taken by the government. Namely, trade of chemicals such as acetic anhydride and acetyl chloride that are used for the manufacture of heroin, were placed under control like any narcotic substance; and punishments for narcotic crimes were increased considerably.

The quasi-medical use of opium in India, Pakistan and Burma was mentioned several times in this paper. It is due to the inadequacy of their medical services and frankly means that opium is administered and sold by people who, in western standards, do not have sufficient background to assume such a responsibility. These governments have declared that, due to the administrative impossibility of abolishing the existing system of consumption of raw opium, they are not in a position to enforce total prohibition immediately and have adopted short-term or long-term schemes of progressive prohibition with a view to restricting the consumption of opium exclusively to medical and scientific needs.

Communist China seems to be the most significant source of illicit opium to-day. According to a report given on March 10, 1952 by the Supreme Commander for the Allied Powers in Japan, investigations, arrests and seizures proved conclusively that the Chinese communists are smuggling heroin into Japan. According to the statements of arrested traffickers, profits from the smuggling were used to finance the activities of the Communist party and to obtain strategic raw materials. Also, a large amount of raw opium from the same source was seized in Thailand. A considerable amount of heroin seized on board a Norwegian ship at New York and several other seizures of heroin in United States originated from Communist China.

In the session of May 5, 1952 the Nationalist Chinese member of the United Nations Commission on Narcotics accused the communists of reorganizing opium cultivation and assisting the illicit trade. It was also claimed that a morphine factory was set up in western China under the auspices of the military authorities. It produced 300 lbs. of morphine a day, most of which was destined for Japan or the Philippines. The communists were not concerned with domestic consumption but were especially interested in discovering foreign markets and obtaining foreign exchange.

Another report by the United States delegate on April 15, 1953 even gave the names and routes of the narcotic traffickers in communist China.

UNITED NATIONS OPIUM CONFERENCE OF 1953 (16)

The results of the United Nations Opium Conference held in May and June 1953 may be evaluated both in relation to the situation resulting from nearly half a century of international endeavor in

the field of narcotics and in relation to what is practical to accomplish at this moment in international affairs.

Previous to the conference the United Nations Commission on Narcotic Drugs took up the question of a very radical solution, namely, the creation of an international opium monopoly which would have been the only agency authorized to buy and sell opium for international trade. After many conferences, however at which this proposal was very fully and carefully considered, the Commission came to the conclusion that the present world situation was not favorable to such a solution, and came forth with a scheme for limiting the production of opium by indirect means. It was this latter plan which the United Nations Opium Conference had to discuss.

The Protocol adopted by the Conference is based on two guiding principles: (a) Free trade in opium should be maintained in so far as this is compatible with the limitation of production and with the maintenance of effective government control; (b) The methods applied for controlling the manufacture of, and trade in manufactured narcotic drugs should be also applied to opium in so far as this is consistent with the nature of an agricultural product.

The provisions of the Protocol may be summed up as follows:

(1) The production of opium would be limited with a view to reducing the amounts harvested to the amounts needed to achieve this aim. Different levels of maximum opium stocks are set depending on the position of a State as exporter of opium produced in its territory, as manufacturer or importer of narcotic drugs. Each state would be required not to hold opium stocks in excess of a specified maximum amount.

(2) The number of states which would be permitted to export opium produced in their own territories would be limited to seven, i.e., Bulgaria, Greece, India, Iran, Turkey, USSR and Yugoslavia. Each country would be authorized to produce opium for its domestic needs.

(3) The use of opium would be limited to medical and scientific needs. The Protocol provides, however, for temporary exceptions in favor of countries which do not have sufficient medical facilities and which permit the use of opium without medical assistance mainly for the relief of pain (quasi-medical use). A time limit of 15 years is set after which such use of opium would have to be discontinued. The Protocol would also permit, opium-smoking by people, not minors,

who are addicted to this practice and who would be registered to this end on September 30, 1953.

(4) The Protocol provides for the control measures as follows:

i) On the national level.—Governments which would permit the cultivation of the opium poppy for the production of opium would be required to establish a governmental machinery which would amount to a national monopoly of the production of, and international and wholesale trade in opium. Only licensed farmers would be permitted to cultivate the poppy for the production of opium. Each license would fix the acreage on which such cultivation is permitted. States which permit the cultivation of the poppy for other purposes than for the production of opium (e.g., for seeds or oil) would be called upon to ensure that opium is not produced from such poppies and that the extraction of alkaloids from poppy straw is adequately controlled. All governments would be required to apply the import certificate and export authorization system to opium and not to permit the import of opium from States not parties to the Protocol.

ii) On the international level.—A system of estimates of the area to be cultivated with the opium poppy for the production of opium, of the opium harvest and opium requirements should enable the Drug Supervisory Body, established under the Geneva Convention in 1931, to advise the governments concerned as to the desirable size of opium crop and thus as to the acreage to be cultivated. A system of statistical returns would in addition enable the Permanent Central Opium Board to supervise the execution by governments of important provisions of the Protocol. If the Board has reason to assume that a gravely unsatisfactory opium situation exists in a country, it would also be authorized to arrange a local inquiry, but only with the express consent of the government concerned. In general, the execution of the Protocol lies on the good faith of the parties and on the strength of public opinion resulting from criticism by the Board. In very extreme cases the Board would, however, be authorized to recommend or impose an import and/or export embargo on opium. The rights of the country concerned are protected by procedural guarantees such as the right to be heard, and in the case of the imposition of an embargo, by the right of appeal to a special appeal body to be appointed by the President of the International Court of Justice.

(5) The Protocol adopts, in agreement with the existing narcotic conventions, the principle of universality. In respect of States

not parties to the Protocol or of territories to which the Protocol would not apply, the Permanent Central Opium Board would accordingly be authorized to adopt measures provided for in the Protocol and intended to appeal to public opinion and, in the very extreme cases referred to above, to recommend or impose an embargo on the import and/or export of opium and opium derivatives.

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THE PHARMACY STUDENTS' PRESENTATION TO INDUSTRY *

By Robert C. Fuller **

THIS title, as you can see, is one that infers an analytical approach. I mean by this—that, while it is in the plural and the apostrophe comes after the word “students’”, it represents an amalgamation of analyses covering many individuals. Just pausing, I like the term “amalgamation” because it means in the case of personalities the same as metals which, while in combination, they do not lose their individual identity. That is the position in which you will find yourselves as you make an approach to industry. In other words, Pharmacy Students fit into a general classification so far as their academic background and training are concerned. However, just as important are the individual’s personality, interest, desires, and thinking. Like the two metals that are amalgamated, you all have a similar or almost identical training but yet do not lose your individual identity because you are *real* persons.

I see that the group is mixed and I, therefore, present another application of this term I have been stressing and that is in the state of matrimony. Two human beings, when they are married, become amalgamated and yet we all know of many, many situations where neither one loses his or her identity and without question asserts that identity under many circumstances. I personally have encountered this sort of thing many times.

Now let’s get back to the opening thought that I expressed. Our theme calls for an analysis. Before a presentation can be made, there has to be some sort of basic analysis of the factors involved. This is no different than what you have been doing in your laboratories, in that you are analyzing compounds to determine the ingredients. In the same way, you must analyze yourselves and determine the ingredients which make up your ability, your personality, your thinking processes, and everything else about yourselves. At this stage we put the apostrophe before the “s” in “student’s” because we are talking

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about individual traits. There are available many tests for evaluating personality and intelligence on the market, some of which you have personally encountered. One of their purposes is to get you to think about yourself and, by means of question and answer, develop a pattern which enables you to catalogue yourself. These tests do serve a useful purpose; however, each one can, if sincere, develop pretty much his or her own pattern. I would not endeavor to set forth here, today, a specific program as, I believe, *that* is something each of you should endeavor to develop for yourself. On the other hand, I cannot *overemphasize your* doing it, prior to any presentation to industry. While you approach industry as graduates of a very fine school of pharmacy, industry is interested not only in your education or academic background but also in your other traits of character, as I have previously mentioned. I would prefer a good student with good outside activities in preference to one who lacked either. You will understand what I mean as I discuss some of these factors.

If one were to list the important elements in evaluating an individual, they would probably be as follows:

1. Academic Training.
2. Personality.
3. Other Activities or Interest.

These three major groupings will be further subdivided and each discussed briefly.

Let us now consider:

1. *Academic Background*

- a. Courses covered.
- b. Grades received.
- c. Special projects applicable to a particular field or phase of industry.

While you have had some choice of subjects during your course, generally they are specific ones which equip you for your profession. However, depending upon particular companies where you might seek employment, certain of the courses may be of more value to them and you should endeavor to know as much as possible about

the company and its position in industry in order to highlight the applicable course.

The grades that you have achieved in your work are important because they give some indication of the effort you have expended and the grasp that you have of the subjects. They also make possible, as some of you over the past several years have experienced, a cataloguing of your position with respect to others.

In the list I also mentioned special projects. This refers to any work you may have carried on outside of the strict course outline. This might include either research or a thesis on a given subject or a report on a particular phase of industrial endeavor by actually conducting an investigation in some industrial establishment. Any activity of this sort is worthy of mention and you should tie it to your general academic training.

2. Personality

- a. Presentation at an interview.
- b. Attentiveness.
- c. Appearance.
- d. Attitude.

The above elements are ones that will assist you in setting the right tone to an interview. Your presentation at an interview should obviously refer to your interest, your knowledge of yourself and how you would fit into such a company. You may wonder where you can obtain the kind of information to which I refer. It can be obtained through credit reports by Dun & Bradstreet, Moody's Reports, Standard & Poor, stock market statistics, and conversations with your professors, librarian, your preceptors, and particularly men from industry.

During your interview, the attentiveness or interest that you show, and what you have found out about the company, will assist you in making a good impression. The interviewer will feel that you are anxious to hear what he has to say. With proper questioning convince him that you are not just job hunting but are interested in his company.

Appearance—I do not need to dwell on this phase because I think you all realize cleanliness, neatness and being well groomed are important assets at all times.

Attitude requires a little more comment than the other personality traits we previously covered. I will emphasize it because of some personal experiences and those of others that have been directed to my attention.

The best example I know is of an individual who incidentally was an engineer and not a pharmacy graduate. During an interview for a position his attitude was somewhat belligerent. In fact, he thought he was offering to this particular company an opportunity of a lifetime in that he appeared for an interview. Of course, this particular company had been in business for some 50 years and extremely successful even for 30 years prior to this individual's arrival on earth. I do not believe that the young man, being interviewed, was able to put across the point that this company *had* to have him. What actually happened was that he quizzed the company on all of its benefits and inferred where he expected to be in so many years after commencing work—however—at no time did he make an effort to sell himself in the sense of being interested in the success of the company and his desire to become a part of it because of its fine reputation, growth and policies. Furthermore, while he had a very good training, he did not indicate or take the attitude that he recognized it needed some practical testing before full value could be received. The applicant had certain abilities that were of interest to this company. I sincerely believe that if he had taken the right attitude he would have been offered a position and had the opportunity to test his knowledge, expand it and use it to further the company's activities as well as his own.

You must realize that, upon graduation, most of you are going out to go to work. During your schooling you have had a very pleasant experience, in most cases, and an opportunity to learn—something not afforded to everyone. The way to use this training is to go to work, and work hard, and in so doing you not only benefit yourselves but those for whom you work.

Now back to our listing of what industry looks for in individuals:

3. Other Activities or Interests

We have considered character and academic background. Now comes the third segment which has to do with the application of free or spare time, interests outside of the classroom, and application of abilities. I am now speaking primarily of extracurricular activities.

They will include, in some cases, people who are working to help themselves through school, people who are devoting time to student and other activities around the college, church, and other organizations. Industry is interested in these activities because they give an indication of an individual's interests, and to a degree, the broadness of his or her outlook. The success in these activities brings into play certain native abilities which will be of value and helpful at work. All of them weigh quite high in the minds of an interviewer because of their future value.

Today we consider many fields of endeavor as being specialized and that each of us has a particular field. That is only true to a limited extent because if we are to progress during our lifetime, we must be able to see the forest and not be limited to looking at an individual tree. I have turned around the old expression that "he could not see the forest for the trees". The broadness in one's thinking in any industry will have a bearing on his growth; because, when moving into the management levels, many phases of the activity must be considered when decisions are to be made for a specific course of action. The degree with which a person has endeavored during his or her student days to go beyond the straight classroom effort is an indication of potential later in life. In this connection there is another thought I would like to leave with you and that is—there are more than 40 or 50 hours in a week and each of you should devote time to developing yourself, even though your work schedule calls for 40 or even 50 hours per week. Putting it another way, do not limit yourself to *so many hours* per week but make an effort to do *more* than what is specifically requested or contracted.

In closing, let us briefly recapitulate what has been covered. First of all is your academic background which covers schooling. Second is personality which concerns you personally. Third, outside activities and interest which, in a sense, are a combination of the first two.

In this presentation you have received some personal experiences as well as thoughts or opinions acquired through practical experiences. I hope that they will be of some value to you as you make your "Presentation to Industry".

ANALYTICAL CONSTANTS OF THE FIXED OIL FROM THE SEED OF PYRULARIA PUBERA

By Rose Goldfield *, Joseph A. Bianculli **, and
Robert W. Sager ***

Introduction

AFTER an investigation (1) of the pericarp of the fruit of *Pyrularia pubera* Michaux, *Santalaceae* showed no pharmacologic activity could be ascribed to the aqueous or alcoholic extracts, attention was given to the oil extracted from the remainder of the fruit.

This study concerned itself with the determination of analytical constants of the fixed oil extracted from the decorticated seeds and a preliminary study of the pharmacologic activity of the fixed oil.

Experimental

The decorticated seeds were air dried for 48 hours, comminuted using a Waring Blender, and stored in an air-tight amber glass jar. A quantitative extraction of the comminuted material using petroleum ether in a Soxhlet apparatus showed the seed to contain 57.5% fixed oil. The fixed oil used in the investigation was obtained by percolating the comminuted material using petroleum ether as the menstruum, removing the solvent on a water bath and drying in a desiccator over calcium chloride.

The analytical constants were determined in the usual manner (2, 3).

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ANALYTICAL CONSTANTS

Saponification Number	189.8
Iodine Number	102.9
Acid Value	9.0
Reichert-Meissl Number	0.1
Polenske Number	0.1
Specific Gravity	0.9240 25°/25°
Index of Refraction	$n_D^{20} = 1.4781$
Unsaponifiable Residue	0.74%
Acetyl Value	27.7
Titer Test of the Fatty Acids	9.9°
Thiocyanogen Number	73.6

From a consideration of the Thiocyanogen Number and the Iodine Number the per cent of pure hypothetical glycerides was calculated (4) and found to be:

Linoleic acid glyceride	36%
Oleic acid glyceride	47%
Saturated acid glyceride and Unsaponifiable Matter	17%

Administration of the oil to rats by gastric intubation produced no noticeable pharmacologic (5) effect.

When administered intravenously to anesthetized rats cannulated for blood pressure recording, no immediate apparent pharmacologic effect was observed.

Summary

Analytical constants of the fixed oil obtained by the solvent extraction of the decorticated seeds of *Pyrularia puberula* Michaux, *Santalaceae* were determined.

The saponification number, iodine number, acid value, Reichert-Meissl number, Polenske number, specific gravity, index of refraction, unsaponifiable residue, acetyl value, titer test of the fatty acids and thiocyanogen number were reported.

Preliminary pharmacologic investigation on rats showed no apparent pharmacologic effect.

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A NOTE ON THE TOXICITY OF METHYL SALICYLATE

By Ephraim G. Sless *

THE profession has been alarmed of late at the number of accidents and fatalities due to drinking of Oil of Wintergreen by children and others. The latest one which occurred in Newark, N. J., was reported as follows:

"William Frazier 3d, 2 year old son of Mr. and Mrs. William Frazier of Susquehanna Avenue, died yesterday in Paterson General Hospital. Passaic County Medical Examiner Surgent said the boy died from the effects of swallowing Oil of Wintergreen. The family believes the child swallowed the Wintergreen Sunday. He died at 8:30 A. M. yesterday."

The U. S. P. describes methyl salicylate as follows:

"Methyl Salicylate—Gaultheria Oil, Wintergreen Oil, Betula Oil, Sweet Birch Oil.

"Methyl Salicylate is produced synthetically or is obtained by maceration and subsequent distillation with steam from the leaves of *Gaultheria procumbens* Linné (Fam. *Ericaceae*) or from the bark of *Betula lenta* Linné (Fam. *Betulaceae*). It contains not less than 98 per cent $C_8H_8O_3$.

"Description: Methyl Salicylate is a colorless, yellowish, or reddish liquid, having the characteristic odor and taste of gaultheria. It boils between 219° and 224° with some decomposition.

"Labeling: Methyl Salicylate must be labeled to indicate whether it was made synthetically or distilled from either of the plants mentioned above."

One will notice from the labeling there is nothing whatsoever to indicate caution. Neither does the Schedule of Antidotes for Poisons issued by the New Jersey Board of Pharmacy mention methyl salicylate or oil of wintergreen.

* President, N. J. State Board of Pharmacy.

References to the toxicology of methyl salicylate list it under the salicylates and the symptoms of poisoning are given as:

- "1. Nausea, vomiting, diarrhea, pain in abdomen.
2. Respiratory paralysis and asphyctic convulsions."

The treatment of acute salicylate poisoning is given as follows:

- "1. Evacuation of the stomach.
2. Administration of purgatives.
3. External heat to combat collapse and subnormal temperature.
4. Respiratory and circulatory stimulants.
5. Artificial respiration if respiratory paralysis is threatened.
6. Large doses of sodium bicarbonate."

The smallest dose of methyl salicylate known to be fatal to an adult was 4.8 cc. Of two adults who drank 6 cc., one survived. Methyl salicylate has been fatal to children under three years of age in doses of as little as 4 to 7 cc.

Gross and Greenberg of Yale University in their book, *Pharmacology and Toxicology of Salicylates*, describe 35 cases of fatal poisoning by methyl salicylate. The *Journal of the American Medical Association* has recorded many cases of fatalities. The *United States Dispensatory*, 1950 edition, carries the following:

"A number of cases of fatal poisoning by methyl salicylate, especially in infants, have been reported. The effects are similar to those of other salicylates. In alcoholic persons the prognosis is poor. The lethal dose has varied from 10 cc. for a child up to 30 cc. for an adult. The symptoms have been vomiting, acidotic type of respiration, and suddenly developing pulmonary edema. The odor is characteristic. Meyerhoff (*J. A. M. A.*, 94, 1751, 1930) reported post-mortem evidence of non-specific degenerative changes in the liver and kidney; Olmsted and Aldrich (*J. A. M. A.*, 90, 1438, 1928) believed the symptoms were due to acidosis, and recommended large doses of sodium bicarbonate in the treatment."

Possibly, there are hundreds of non-fatal cases that have not been reported or described in the literature.

The poison law as administered by the New Jersey Board of Pharmacy under section 45:14-20 entitled, "Dispensing of certain poisons regulated; schedule 'B'", reads:

"No person shall sell at retail or dispense any of the poisons enumerated in schedule 'B', appended to this section or any other substance recognized by standard authorities on medicine, materia medica or toxicology as poisonous without first learning by inquiry that the person to whom delivery is made is aware of the poisonous character of the substance, and is a proper person to purchase such drugs, and that it is desired for a legitimate purpose, and, before making such delivery, the package, bottle, box, can, container or wrapper in which said poison is contained must be labeled with a red label stating the name of the article in English, the word 'poison' and the name and place of business of the dispenser.

"Schedule 'B'. Cannabis, cantharides, Chinese blistering beetle, cocculus indicus, colchicum, cotton root bark, digitalis, ergot, gelsemium, hellebore, henbane, ignatia amara, phytolacca, nux vomica, veratrum, stramonium, savin, chloroform, ether, wood or methyl alcohol, white precipitate, red precipitate, silver nitrate, copper salts, salts of barium, lead salts, oxalic acid, mineral acids, arsenical solutions, iodine, tincture of iodine, carbolic acid, creosote, croton oil, oils of pennyroyal, rue, savin or tansy or any other drug, chemical, substance, or preparation which according to standard works on medicine, materia medica, or toxicology, while not considered as toxic in doses of five grains or less, is nevertheless, liable to be destructive of adult human life in doses of sixty grains or less."

The author believes that methyl salicylate should be classified as a Class B poison.

Under the heading, "Label Information on Official Drugs," the Department of Health of the State of New Jersey published in the May, 1943, *Journal of the N. J. Pharmaceutical Association* the following copy for an Oil of Wintergreen label:

"Oil of Wintergreen U. S. P. (Synthetic or Natural)

As a liniment for minor bruises, apply lightly.

Adult dose. 5 to 10 drops on a little sugar with a glass of water three times daily.

Caution: This preparation may cause excessive irritation of the skin, particularly if applied with rubbing. Avoid getting into the eyes or on mucous membranes."

Today, 10 years later, this label is outmoded. Most of the preparations sold are methyl salicylate synthetic and very few people take it internally. The common practice is to mix it with alcohol and rub vigorously or rub into skin as a counter-irritant.

The labels of over 100 New Jersey drug stores were examined; many colors were used, the majority did not mention methyl salicylate, the heading read—"Oil of Wintergreen U. S. P. (Synthetic)." The internal dosage given varied from 5 to 12 drops on sugar and most of them contained the quotation, "Caution—This product may cause excessive irritation of the skin, particularly when applied with rubbing. Avoid getting it into the eyes, on mucous membranes or on the broken skin," as required by the New Jersey Department of Health as of May, 1943. It was also interesting to note that some labels read, "This preparation is not intended for internal use."

In the interest of the Public Health and Welfare, every pharmacist should consider this label for his future dispensing of methyl salicylate or oil of wintergreen:

POISON

METHYL SALICYLATE U. S. P.
(Oil of Wintergreen—Synthetic)

For External Use Only

Directions: Apply lightly as a liniment.

Caution—This product may cause excessive irritation of the skin, particularly when applied with rubbing. Avoid getting it into the eyes, on mucous membranes or on the broken skin.

Keep out of reach of CHILDREN.

May be fatal if taken internally.

In the event of accident, call Physician and give large doses of bicarbonate of soda.

This label should be printed in Red, the same as all other poison labels.

The author feels it of importance that further research and study should be done relative to the toxicity and proper labeling of this preparation.

SELECTED ABSTRACTS

Oxytetracycline With Streptomycin Found to Be Effective in Tuberculosis. Rothstein, E., and Johnson, M. *Am. Rev. Tuberc.* 69:1 (1954). Oxytetracycline has been found to have some inhibitory effect on the tubercle bacillus when used alone *in vitro*. However, clinically, little or no improvement has been found.

The authors used oxytetracycline along with streptomycin in the treatment of 81 patients. The emergence of strains resistant to streptomycin was found to be inhibited or prevented to a marked degree. In comparison with combined therapy of streptomycin and PAS, it was found that oxytetracycline was essentially as effective as PAS in the inhibition of the development of streptomycin resistant strains. X-ray and sputum studies showed that the clinical improvement was practically the same whether PAS or oxytetracycline was given with the streptomycin.

A rather low dosage of oxytetracycline appeared to be effective. A dose of 1 Gm. a day appeared to be all that was required. With this low dosage toxicity to the oxytetracycline was insignificant. Patient acceptance was much better than with PAS because of the low dosage and the low incidence of side effects.

The authors, therefore, concluded that in patients requiring streptomycin therapy but showing evidences of intolerance to PAS, oxytetracycline may be substituted without danger of increasing the incidence of the emergence of streptomycin resistant strains of the tubercle bacillus.

The Transfer to Insulin Zinc Suspension Lente. Fitzgerald, M. G., Thorn, P. A., and Malins, J. M., *The Lancet* 1:187 (1954). A group of 30 diabetic patients who had been under treatment with soluble insulin (SI), protamine zinc insulin, or globin insulin were transferred to Insulin Zinc Suspension Lente. Most of the patients selected were in poor biochemical control and most of the remainder were in poor clinical control.

The results obtained suggested that the transfer of cases with poor biochemical control of their diabetes to an equal dose of I. Z. S. is more likely to produce deterioration than improvement. A larger dose is likely to be required at the time of transfer. Particularly is this true with patients who have been receiving two doses of S. I. and also with those receiving a high proportion of S. I. to P. Z. I.

In patients who are under strict biochemical control the distribution of dietary carbohydrate may need to be changed at the time of transfer. Less carbohydrate will be required at breakfast and more at lunch.

The few patients in this group who were both clinically and biochemically well controlled before transfer remained so after transfer. Among the thirty patients, 16 showed no change in the control of their diabetes as a result of transfer to I. Z. S. while 10 became worse.

As a result of these studies, the authors pointed out that the transfer to insulin zinc suspension lente from other types of insulin is not without risk.

The Use of Succinylcholine as a Muscle Relaxant. Moller, C. F., and Weiss, W. A. *U. S. A. F. Med. J.* 5:212 (1954). Succinylcholine chloride (diacetylcholine chloride) was administered to an unselected group of 205 patients as an adjunct to general anesthesia. In most cases the anesthesia was accomplished by means of thiopental sodium along with nitrous oxide and oxygen or in some cases with ether. The drug proved to be an ultra short-acting muscle relaxant. The onset of its effect was very rapid and complete return of muscle tone occurs within five minutes of the termination of administration of the drug.

The drug may be administered as a single intravenous injection of from 10 to 40 mg. This type of administration provided ideal muscle relaxation for laryngoscopy in 97.5 per cent of the patients. It was also used as a 0.1 per cent solution in 5 per cent dextrose by slow intravenous drip. Excellent muscle relaxation was obtained also by this method. The degree of muscular relaxation could be controlled by the rate of drip.

The principal advantage of this drug is its rapid onset and short duration of action. However, it also apparently does not possess the histamine-like depressor response such as that of tubocurarine chloride.

The drug is rapidly hydrolyzed in alkaline solution and thus may not be given in the same solution or infusion tube with barbiturate salts. It dissolves readily in water, forming a slightly acid solution. This acid solution is relatively stable and may be sterilized by autoclaving.

BOOK REVIEWS

A History of the College of Pharmacy, Columbia University.

By Charles W. Ballard. Columbia University Press, 2960 Broadway, New York 27, N. Y. \$2.00.

Established in 1829, the College of Pharmacy of Columbia University is the oldest such institution in the State of New York. In this 89-page book, former Dean Ballard traces the steps in the history of the College from its beginnings as an independent school to its present close affiliation with Columbia University. He does it in a very human, understanding fashion, as only a man who has been close to the scene for a long time could do.

The cold facts of dates, names, and places are well treated with anecdote, sidelight, and logical explanation. The typography of the book is very pleasing, and an index helps in finding wanted references. It is unfortunate that more pictures of the older college scenes could not be included, for then the record would have been complete for both mind and eye.

JOHN E. KRAMER

Optical Crystallography, Second Edition. By Ernest E.

Wahlstrom, University of Colorado. 247 Pages. John Wiley & Sons, Inc., New York, 1951. \$4.50.

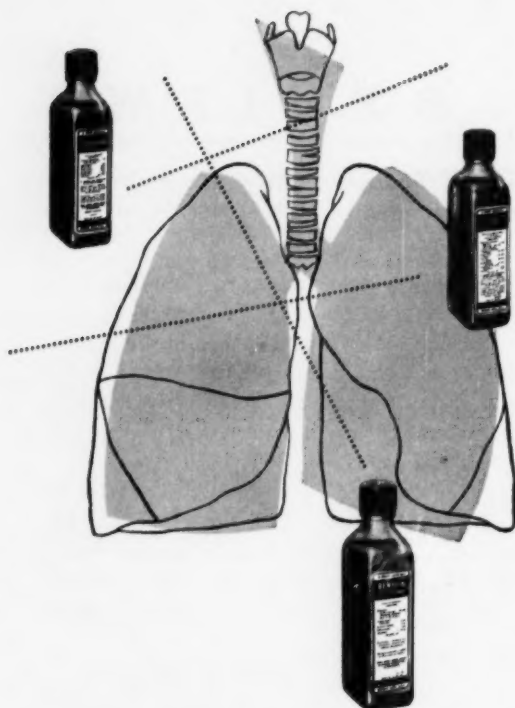
This edition has been completely revised and expanded by about 50 pages. The first chapter deals with geometrical crystallography and the second with physical properties of crystals other than optical properties.

Elementary Optics is taken up in the third chapter and this serves to introduce and give background for the topics in the following fourteen chapters. The entire book is well illustrated.

Such physical principles as index of refraction, polarization and interference figures, and apparatus necessary for determining the structure of a particular crystal are clearly explained.

This book is an excellent text for students in this branch of crystallography.

ROBERT N. JONES



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